

RECENT COUNTS OF WATTLED CRANES *'BUGERANUS CARUNCULATUS* ON THE KAFUE FLATS, ZAMBIA—NOVEMBER 1987

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The population of Wattled Cranes *Bugeranus carunculatus* on the Kafue Flats in southern Zambia has attracted attention over the last 15 years because of the possible effects of the Kafue Hydroelectric Scheme (Douthwaite 1974, Konrad 1980, Howard & Aspinwall 1984, Urban 1988). An aerial census of the Kafue lechwe antelope *Kobus lechwe kafuensis* from 11 to 13 November 1987 afforded an opportunity to count some parts of the Kafue Flats' population of Wattled Cranes in a way that was comparable with the most recent published estimate of Howard & Aspinwall (1984).

METHODS AND RESULTS

The Kafue Flats is a major wetland of Zambia consisting of the floodplain of the Kafue River between 15 and 16°S and 26 and 28°E. The floodplain is approximately 250 km long and more than 60 km across at its widest point (Howard 1985) and its central area (Fig. 1) contains parts of Lochinvar and Blue Lagoon National Parks. This central area of the Flats is the main refuge of many floodplain animals and is the least disturbed part of the wetland. The major concentration of Wattled Cranes of the Kafue Flats is known to occupy this central area (Douthwaite 1974, Konrad 1980).

The stratified random sampling technique used for the aerial census of the lechwe was described by Howard & Jeffery (1984) and was essentially the same as that reported by Howard & Aspinwall (1984). Wattled Cranes were counted and recorded when they were detected in the lechwe-counting transects (200 m wide, 200 feet (c. 70 m) above ground) in four (of the six) strata involved in the 1987 count (see Fig. 1). Group sizes were also recorded of those birds seen inside the transects.

The numbers of birds recorded in the four strata are shown in Table 1 together with the computed estimates of Wattled Cranes for these strata. These give a total of 369 birds counted and an estimate for the sampled area of 2508 Wattled Cranes.

Table 1. *Numbers counted and population estimates of Wattled Cranes in the sampled areas of the Kafue Flats, 11–13 November 1987*

Stratum*	%Stratum sampled	Cranes counted	Estimates**
1	8.8	72	818
2	15.6	131	840
3	13.3	53	398
4	25.0	113	452
Totals		369	2508

* Fig. 1; **Estimated population = $\frac{\text{birds counted}}{\% \text{ stratum sampled}}$

¹Called *Grus carunculatus* in *Birds of East Africa*

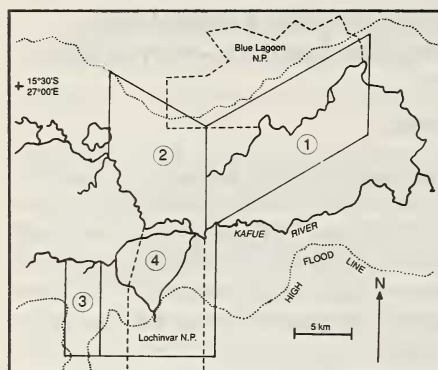


Fig. 1. The central part of the Kafue Flats showing the strata sampled in November 1987

Table 2. Frequencies of recorded group sizes of Wattled Cranes on the Kafue Flats, November 1987

Group size	Frequency of observation	Sum of birds in group size
1	0	0
2	67	134
3	9	27
4	2	8
5	0	0
6	2	12
11	1	11
13	3	26
15	1	15
18	1	18
19	1	19
24	1	24
37	1	37
38	1	38
		369

200

Group sizes of birds in the transects are presented in Table 2. The numbers of groups in the strata and the mean group sizes per stratum are shown in Table 3. Stratum 2 had mainly pairs of Wattled Cranes with three groups of three birds and one group of 38 inside the transects. The other large group 37 was in the western end of Stratum 4 (Fig. 1); this stratum had the largest number of groups exceeding three birds.

Table 3. Numbers of Wattled Cranes observed in each stratum with mean group size

Stratum	No. of groups	Mean group size
1	17	4.2
2	46	2.8
3	11	4.8
4	15	7.5
Totals	89	4.1

DISCUSSION

The area sampled in these four strata represents approximately two-thirds of the area counted in 1982 by the same technique and counter (Fig. 1, cf. Howard & Aspinwall 1984, Fig. 2). However, the area censused in 1987 was the portion occupied by approximately 90 per cent of the Wattled Cranes counted in 1982. At first sight, therefore, there appears to be a drop in the estimated population of Wattled Cranes in the sampled area of this central part of the Kafue Flats between 1982 and 1987 (90 per cent of 3282 cf. 2402—an apparent decline of 19 per cent in five years). But there are

two significant factors to be considered in comparing these two estimates: the time of the year in which counts were made and the composition of the counted groups.

The 1982 census was carried out in late May while the 1987 count was made in early November. In this respect the two estimates are not strictly comparable as we know that the *distribution* of Wattled Cranes on the Kafue Flats changes during the year (Douthwaite 1974).

Reference to Table 2 (and Table 3 of Howard & Aspinwall 1984) shows that the numbers of birds counted in the two surveys is about the same in the small groups (group sizes 1 to 4), totalling 153 in 1982 and 169 in 1987). The major differences between the counts for the two estimates are the large groups of Cranes (four groups over 50 in number, totalling 496 birds) which were present in May 1982 but were absent from the sampled transects in November 1987. It is suggested that these large groups may have left the sampled area by November 1987—either for another part of the Kafue Flats or for the postulated migration to the Makgadikgadi Pans in Botswana where there is an accumulation of Wattled Cranes during the wet season (Collar & Stuart 1985, Urban 1985). It is essential to an understanding of the conservation status and the population dynamics of this population of Wattled Cranes that the movement or dispersal of these large groups is studied further.

The Cranes that occurred in pairs or threes were likely to have been mated pairs so their distribution among the strata may be useful in locating the breeding (or post-breeding) sites of these birds. The strata 2 and 3 were the areas of major accumulation of pairs with some being recorded from the other two strata as well. Breeding is likely to have been completed by November and the chicks ready to leave or already gone from their parents (Douthwaite 1974, Collar & Stuart 1985). The pairs are thus likely to represent some of the resident breeding birds (Konrad 1980).

The accuracy of these estimates is difficult to assess and no attempt has been made to calculate errors of variances for this population (see also Howard & Aspinwall 1987). The combination of relatively sedentary small groups of birds (pairs and threes) with the flocks of tens to hundreds renders this stratified system of random sampling not especially appropriate for this population of Cranes. The sampling proportions within strata (Fig. 1) are adequate for lechwe but may not be the most appropriate for Wattled Cranes. The size of the transects seem sensible for small groups of birds but do not always allow representation of the widely scattered large flocks. While it is realized that a new sampling programme should be developed especially for the Cranes, the data available as a by-product of the lechwe census are nevertheless of use for comparison and should be continued in the future. There is need for a more comprehensive survey method to cover a larger area of the Kafue Flats, to observe the remainder of breeding birds, to monitor the movements of the larger flocks and to assess the significance of the many semi-resident pairs of birds scattered on small wetlands (such as *dambos*) throughout much of southern, western and northern Zambia.

The counts recorded here tell us that the status of the small groups of birds in the Wattled Crane population of the central Kafue Flats remains little changed over the five years from 1982 to 1987. The same data pose questions about the larger flocks and

highlight areas for further research on this important wetland bird. These recent counts also show no evidence of any effect on Crane population of the new (10 years old) flooding regime of the Flats brought about by the operation of the Kafue Hydroelectric Scheme.

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